

Application No. 09/611,955
Amendment dated February 28, 2006
Reply to Office Action of November 29, 2005

Docket No.: 20136-00318-US

REMARKS

Claims 25-32 are now in the application.

Claims 25-32 were rejected under 35 U.S.C. § 112, second paragraph as being indefinite. in the recitations "a conductive barrier located over said insulation layer in said recess and over said at least one major surface" and "a conductive metal in said recesses only". This rejection is not deemed enable.

The specification expressly discloses providing a conductive barrier located over the insulation layer. For example, page 8, lines 1 and 2 state:

"Next, a conductive barrier 4 is provided over the insulating layer." Also see Figure 3.

The specification also expressly discloses "a conductive metal in said recesses only."

Along these lines, see page 6, lines 19-22, which states:

"An electroplated conductive metal is located in the recesses only... and not on other portions of the substrate."

Also see page 10, lines 9 and 10, which states:

"The conductive metal does not plate on the barrier layer but instead preferably plates on the seed layer." The seed layer remains in the recesses only (see page 6, lines 18-19).

Accordingly, at this stage, the conductive metal only plates in the recesses, not on the major surface of the substrate, even though small amounts of excess of conductive metal might exist above the recesses. Therefore, as stated at page 12, lines 11-27 of the original disclosure, the conductive material 8 can then be chemically-mechanically polished to remove small amounts of metal above the surface of the recesses. Typical polishing slurries contain colloidal silica. At this and prior to removal of the barrier layer 5, all of the claimed recitations are disclosed. Claiming a structure at this stage is entirely proper.

It is only, after removal of the small amounts of metal above the surface of the recesses, is the barrier layer 5 removed. For example, see page 12, lines 16 and 17 that state:

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"Next, the barrier layer 5 and plated metal is removed down to the insulating layer 3 (see Fig. 4)." (emphasis mine)

For a similar disclosure, also see figure 7.

Claims 25 and 28-32 were rejected under 35 USC 103 as being unpatentable over US Patent 5,821,168 in view of US Patent 4,577,395 to Shibata. The cited references fail to render obvious claims 25 and 28-32.

As appreciated by the examiner, the recesses 72 in insulating layer 52 of Jain do not exist in a semiconductor substrate as recited in the claims. The recesses exist only on the substrate. In fact, the recesses (i.e. interconnect channels) in Jain referred to in the office action cannot exist in the semiconductor substrate since they must be present above the interconnects 28. Therefore, in view of the process and structure required by Jain, the recesses cannot exist in the semiconductor substrate. To include the recesses in the semiconductor substrate would be contrary to the objectives of Jain and defeat the purposes of the reference.

US Patent 4,577,395 to Shibata fails to overcome the above discussed deficiencies of Jain with respect to rendering unpatentable the above claims since, among other things, Shibata is not even properly combinable with Jain. As stated above, including the recesses in the semiconductor substrate would be contrary to the objectives of Jain and defeat the purposes of Jain. Moreover, Shibata does not include a barrier layer or metal in the recesses.

Claims 26 and 27 were rejected under 35 USC 103 as being unpatentable over US Patent 5,821,168 in view of US Patent 4,577,395 to Shibata and further in view of US Patent 6,329,284 to Maekawa. The cited references fail to render obvious claims 26 and 27. US Patent 6,329,284 to Maekawa fails to overcome the above discussed deficiencies of Jain and Shibata with respect to rendering unpatentable the present claims. In addition, the presence of a layer of tantalum nitride and a layer of tantalum as recited in claims 26 and 27 would not be present in Jain because of the process required by Jain which involves nitriding of the oxide dielectric. See column 2, lines 35-38. To include layers of tantalum nitride and a layer of tantalum as mentioned by Maekawa would be contrary to the stated objections of Jain and therefore not an obvious modification.

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The mere fact that cited art may be modified in the manner suggested in the Office Action does not make this modification obvious, unless the cited art suggest the desirability of the modification. No such suggestion appears in the cited art in this matter. The Examiner's attention is kindly directed to *In re Lee* 61 USPQ2d 1430 (Fed. Cir. 2002) *In re Dembiczak et al.* 50 USPQ2d. 1614 (Fed. Cir. 1999), *In re Gordon*, 221 USPQ 1125 (Fed. Cir. 1984), *In re Laskowski*, 10 USPQ2d. 1397 (Fed. Cir. 1989) and *In re Fritch*, 23, USPQ2d. 1780 (Fed. Cir. 1992).

In *Dembiczak et al.*, supra, the Court at 1617 stated: "Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references. See, e.g., C.R. Bard, Inc., v. M3 Sys., Inc., 157 F.3d. 1340, 1352, 48 USPQ2d. 1225, 1232 (Fed. Cir. 1998) (describing 'teaching or suggestion motivation [to combine]' as in 'essential evidentiary component of an obviousness holding'), *In re Rouffet*, 149 F.3d 1350, 1359, 47 USPQ2d. 1453, 1459 (Fed. Cir. 1998) ('the Board must identify specifically...the reasons one of ordinary skill in the art would have been motivated to select the references and combine them');...".

The present invention could only be derived from the cited art by the use of "hindsight", i.e. by knowing what Applicants' invention was in advance from Applicants' disclosure, and then *ex post facto* reconstructing Applicants' invention from the prior art after a thorough search. It is impermissible under 35 U.S.C. 103 to use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. See *In re Fine*, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). Furthermore, it is well settled that hindsight reconstruction using the patent application as a guide through the maze of prior art references, combining "the right references in the right way" so as to achieve the result of the claimed invention must be avoided. See *Grain Processing Corp. v. American Maize-Products Corp.*, 5 U.S.P.Q.2d 1788 (Fed. Cir. 1988).

In view of the above amendment, applicant believes the pending application is in condition for allowance.

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In the event the Examiner believes an interview might serve to advance the prosecution of this application in any way, the undersigned attorney is available at the telephone number noted below.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 09-0458, under Order No. 20136-00318-US from which the undersigned is authorized to draw.

Dated: February 28, 2006

Respectfully submitted,

By 

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